

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANT: Barend Visser : GROUP ART UNIT: 1754
SERIAL NO: 09/914,199 :
FILING DATE: March 5, 2002 : EXAMINER: M. Medina
TITLE: METHOD AND APPARATUS :
FOR PRODUCING OZONE : ATTY DKT: P-1707

DECLARATION UNDER RULE 1.132

Commissioner For Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Dear Sir:

I, Barend Visser, hereby declare as follows:

1. I am the named inventor in the above-captioned patent application.
2. My educational credentials include a Master of Science degree in physics from Potchefstroom University. I have been employed by the Unit for Space Physics, Potchefstroom University, since 1987 for the development of detectors, test and measurement apparatus, as well as control systems, and I have been involved in ozone-related projects of various departments of the University since 1990.
3. I have reviewed the office action mailed July 11, 2003, the United States patent that is cited as an alleged anticipation of my invention, i.e., U.S. Patent 4,038,165 to Lowther, and the attached listing of claims 20-34 in anticipation of their being submitted in response to the office action.
 - a. In view of the foregoing, it is my opinion that a person of ordinary skill in the art would recognise that the device described in the Lowther Patent does not generate ozone in accordance with the method and apparatus defined in the attached claims, because the newly submitted claims specify a rate of change of the electric field in the electrode region that is not shown by Lowther.
 - b. Lowther does not expressly state the rate of change of the electric field in the device described therein, but the relevant rate of change can be determined as follows. In column 9,

[Handwritten signature] *BV*

-2-

line 35, it is stated, "Typically, the DC power supply 45 is adjusted to operate about 5000 to 30,000 volts DC." It is clear that this voltage refers to the voltage over the power supply (45) and not the sparking voltage (V_s) across the discharge gap (t_g). The latter is calculated in column 5, line 25, to be 6992V, or indicated in column 6, line 55, to be 6975V.

c. The gap (t_g) between the electrodes in the Lowther apparatus is 1.15 mm (see column 5, line 17).

This implies an electric field of

$$E = V/t_g = \frac{6992}{1.15} = 6080 \text{ Volt/mm}$$

d. The desired pulse width (T_w) in the Lowther apparatus is equal to 66ns (see column 6, line 30).

e. Since the rise time (T_r) of the pulses generated by the Lowther apparatus is nowhere disclosed in the document, it may be computed by the following known equation:

$$T_r = \frac{T_w}{\pi} = \frac{66\text{ns}}{\pi}$$

f. Hence, the rate of change of the electric field (E) is given by

$$\begin{aligned} \frac{dE}{dt} &= \frac{E}{T_r} \\ &= \frac{6080}{66\text{ns}/\pi} = 2.9\text{kV/mm/10ns} \end{aligned}$$

which is less or slower than the claimed parameter of "faster than 3kV/mm/10ns".

g. Also the reference in column 12 lines 59 to 63 referred to by the examiner in paragraph 7 of the action does not teach or describe conditions which would lead to an electric field to change at a rate faster than 3kV/mm/10ns. In fact, this section relates to a static electric field which is used for neutralising heavy gas ions in the discharge gap and is not used for generating ozone. This field is not changing and by no means at the rate claimed by the applicant.

2 BV

-3-

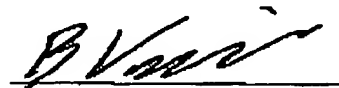
h. For the foregoing reasons, it is submitted that independent claims 20 and 23 are novel in view of the disclosure in Lowther, because Lowther does not disclose or imply an electric field in the electrode region which changes at a rate faster than 3kV/mm/10ns. The aforementioned claims are also inventive in view of Lowther, as Lowther specifically teaches away from manipulations of frequency and waveform to obtain improved efficiency in ozone generators (see column 1 lines 35 to 46).

i. A method and apparatus according to claim 1 or claim 4 yields substantial improvements in efficiency relative to the prior art, due to the spontaneous ionisation of O₂, as opposed to the electron collision ionisation of the prior art, as produced by the Lowther method and apparatus.

j. Claim 34 defines a novel feature in a circuit of a voltage generating means which facilitates the implementation of the method defined in claim 20.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such wilful false statements may jeopardise the validity of the application or any patent issued thereon.

Respectfully submitted,



Barend Visser

NOTARISATION: Signed before me ANDRÉ LOESER MULLER

NOTARY PUBLIC by lawful authority, duly sworn and admitted and residing and practising at Potchefstroom in the Province of North West, South Africa on this 13 day of October 2003, in the presence of the aforewritten Barend Visser.

